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ERIOPHYID STUDIES XIII*

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Insect Taxonomy
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The present installment comprises ten new species of Eriophyid mites. These include a bud mite on English Ivy, and a rust mite on Camellia, of interest to the Nursery Service of the State Department of Agriculture. The species described on Honolulu litchi nut is a noticeable pest of that tree. The new silver mite on almond is structurally different from the closely related peach silver mite.

In installment XII the term "Primogyne" was proposed as the opposite of "Deutogyne." The former word is etymologically wrong and should be "Protogyne," which will be used hereafter.

Phytoptus hedericola Keifer, new species

Plate 170

Female up to 180 μ long, 35-40 μ thick, wormlike, light yellow. Rostrum 23 μ long, projecting forward and down, antapical seta short. Shield 23 μ long, 30 μ wide, design a pattern of longitudinal lines, bearing 4 setae; dorsal tubercles 17.5 μ apart, well ahead of rear margin; dorsal setae about 15 μ long, projecting forward; anterior setae 7.5 μ long, 20.5 μ apart. Forelegs 26 μ long, tibia 6 μ long, with lateral seta, tarsus 5 μ long, claw 8.5 μ long, slender. Hindlegs 23 μ long, patellar seta lateral, tibia 5 μ long, tarsus 5 μ long, claw 8.5 μ long. Anterior coxae connate, setae II just ahead of transverseline through base of setae III. Abdomen with about 60 rings, the rings strongly microtuberculate, with slight dorsoventrad increase in ring number; dorsal rear lacking tubercles. Dorsal seta about 30 μ long, on ring 11. Lateral seta 15 μ long, on about ring 10; first ventral about 25 μ long, on about ring 23; second ventral 15 μ long, on about ring 35; third ventral 15 μ long, on about ring 5 from rear; accessory seta present. Female genitalia 17.5 μ wide, 10 μ long, coverflap smooth except for slight basal tuberculation, seta 5 μ long.

Male not seen.

Type locality: San Mateo, California. **Collected**: December 26, 1942, by the writer. **Host**: *Hedera helix* L., English Ivy. **Relation to host**: The mites inhabit the buds and petiole bases, causing leaf deformation and stunting of the growth. **Type slide**: so designated, with the above data. **Paratype slides**: five in number as above. Damage is particularly severe to dwarf potted ivy. This mite belongs to the *Phytoptus* group bearing four shield setae. It differs from the two other species of this type mainly by the six or more shield lines—*avellanae* has only two and *corniseminis* has none.

Eriophyes litchii Keifer, new species

Plate 171

O'Gara-Eriophyes chinensis, Science NS. Vol. 44, p. 142, 1916 (preoccupied)

Female 110-135 μ long, 30 μ thick, wormlike, yellowish to reddish. Rostrum 15 μ long, somewhat downcurved. Shield 23 μ long, 23 μ wide, definite longitudinal central lines, granular laterally; dorsal tubercles 16 μ apart, on rear margin; dorsal setae 17 μ long, projecting caudad. Forelegs 20 μ long, tibia 4.5 μ long, tarsus 4.5 μ long, claw 5 μ long, curved, slightly knobbed, featherclaw 5 rayed. Hindlegs 19 μ long, tibia 4 μ long, tarsus 4.5 μ long, claw 6 μ long. Coxae strongly tuberculate; setae I ahead of junction of anterior coxae. Abdomen with 55-60 rings which are completely microtuberculate. Lateral seta 18 μ long, on about ring 8; first ventral 40 μ long, on about ring 21; second ventral 5 μ long, on about ring 32; third ventral 12 μ long, on about ring 6 from rear; accessory seta present. Female genitalia 15 μ wide, 10 μ long, coverflap with about 16 curved furrows, seta 9 μ long.

Male not seen.

* Eriophyid Studies XII, an account of the deuterogynous condition of certain rust mites, appeared in the Bul. Cal. Dept. Agr. Vol. 31, No. 3, p. 117, Sept. 16, 1942.

Type locality: Pensacola, Honolulu, T. H. **Collected**: November 10, 1942, by T. Nishida. **Host**: *Litchi chinensis* Sonn. Litchi nut. **Relation to host**: The mites form a fine red erineum on the undersurface of the leaf, often involving and curling the whole leaf. **Type slide**: so designated, with the above data. **Paratype slides**: six in number as above. The five-rayed featherclaw, definite shield pattern, and style of coverflap furrows, type this species. These suggest an affinity to the citrus bud mite, *Eriophyes sheldoni* Ewing. The name *chinensis* was first used by Trotter, 1900, Bul. Soc. Ent. France N. 8, p. 180, for a leafgall former on *Prunus armenica* L.

Eriophyes boycei Keifer, new species

Plate 172

Female up to 170 or 180 μ long, 50-60 μ thick, wormlike, light yellow. Rostrum 15 μ long, projecting forward. Shield 25 μ long, 55 μ wide, design a clear-cut pattern of longitudinal lines; dorsal tubercles 38 μ apart, on rear margin; dorsal setae 32 μ long, projecting caudad. Forelegs 25 μ long, tibia 4 μ long, tarsus 6 μ long, claw 8 μ long, slender, tapering, featherclaw 4 rayed. Hindlegs 21 μ long, tibia 4 μ long, tarsus 5.5 μ long, claw 8 μ long. Anterior coxae broadly contiguous. Abdomen with 60-65 rings, completely microtuberculate, the microtubercles bearing short spines; some ventrad reduction in ring number. Lateral seta 18 μ long, on about ring 9; first ventral 37 μ long, on about ring 23; second ventral 6.5 μ long, on about ring 37; third ventral 18 μ long, on about ring 5 from rear; accessory seta present. Female genitalia 38 μ wide, 14 μ long, coverflap with about 10 furrows, seta 8 μ long.

Male not seen.

Type locality: Fillmore, California. **Collected**: August 8, 1940, by Dr. A. M. Boyce and the writer. **Host**: *Ambrosia psilostachya* DC., Western Ragweed. **Relation to host**: The mites form numerous bead galls on the terminal leaves. **Type slide**: so designated with the above data. **Paratype slides**: 5 in number, as above. The species is characterized by the definite shield pattern, the pointed microtubercles, the four-rayed featherclaws. The writer takes pleasure in naming this mite for Dr. A. M. Boyce. This mite is an inhabitant of the area where citrus bud mite is found and wandering examples could be confused with it.

Eriophyes ligustri Keifer, new species

Plate 173

Female 150-190 μ long, 35-40 μ thick, wormlike, yellowish. Rostrum 24 μ long, curved down. Shield 30 μ long, 30 μ wide, rounded anteriorly, central design obsolete, the sides granular; dorsal tubercles 21 μ apart, on rear margin; dorsal setae 24 μ long, projecting caudad. Forelegs 26 μ long, tibia 6.5 μ long, tarsus 5.5 μ long, claw 6 μ long, somewhat curved, knobbed, featherclaw 4 rayed. Hindlegs 25 μ long, tibia 6 μ long, tarsus 6 μ long, claw 6.5 μ long. Coxae somewhat tuberculate, anterior coxae touching. Abdomen with 60-65 rings which are densely microtuberculate; the last 10-12 rings broader, the tubercles finer, more elongate. Lateral seta 20 μ long, on about ring 10; first ventral 50 μ long, on about ring 23; second ventral 12 μ long, on about ring 39; third ventral 23 μ long, on about ring 4 from rear; accessory seta present, moderate size. Female genitalia 20 μ wide, 11 μ long, coverflap with about 10 furrows, seta 11 μ long.

Male 120-140 μ long, 35 μ thick.

Type locality: Sacramento, California. **Collected**: At various dates during July and August, 1943, by the writer. **Host**: *Ligustrum ovalifolium* Hassk., Privet. **Relation to host**: The mites form a moderately plentiful population in the host buds. **Type slide**: so designated, with the above data and dated July 20. **Paratype slides**: five in number, as above. The four-rayed featherclaw and smooth cephalothoracic shield are among more important characters of this mite.

Phyllocoptes ambrosiae Keifer, new species

Plate 174

Female 120-130 μ long, 40 μ wide, 40 μ thick, a robust, stocky, light amber-colored species. Rostrum 15 μ long, projecting obliquely down and forward, setae small. Shield 37 μ long, 35 μ wide, design obscure but lines and microtubercles laterally; dorsal tubercles 26 μ apart, on rear margin; dorsal setae 8 μ long, projecting up and backward. Forelegs 27 μ long, tibia 5 μ long, tarsus 6 μ long; claw 6.5 μ long, slender, tapering, knobbed; featherclaw 5 rayed. Hindlegs 24 μ long, tibia 4 μ long, tarsus 6 μ long, claw 6 μ long. Coxae slightly lined, setae II well ahead of transverse line through setae III. Abdomen with microtuberculate sternites projecting high on sides, tergites non-tuberculate and formed as raised bands; about 19-20 tergites; about 50 sternites. Lateral seta 15 μ long, on about sternite 6; first ventral 30 μ long, on about sternite 18; second ventral 10 μ long, on about sternite 31; third ventral 12 μ long, on about sternite 5 from rear; accessory seta present. Female genitalia 17 μ wide, 12 μ long, coverflap with about 12 furrows, seta 11 μ long.

Male not seen.

Type locality: Fillmore, California. **Collected**: August 8, 1940, by Dr. A. M. Boyce and the writer. **Host**: *Ambrosia psilostachya* DC, Western Ragweed. **Relation to host**: The mites are leaf vagrants. **Type slide**: so designated, with the above data. **Paratype slides**: 5 in number, as above. This species has a distinct facies, with the short anterior shield lobe and yoke-like tergites.

Phyllocoptes paracornutus Keifer, new species

Plate 175

Female 150-200 μ long, 65 μ wide, 45 μ thick, yellowish to amber in color, spindle-form. Rostrum 23 μ long, projecting down, apical seta moderate. Shield 50 μ long, 70 μ wide, with transverse indentation on front edge, below which are the 2 spines; design a network with transverse anterior ridges prominent; dorsal tubercles 35 μ apart, on rear margin, dorsal setae 11 μ long, projecting backward. Forelegs 37 μ long, tibia 9 μ long, tarsus 7.5 μ long; claw 7.5 μ long, knobbed, featherclaw 4 rayed. Hindlegs 33 μ long, tibia 7 μ long, tarsus 7.5 μ long, claw 7 μ long. Coxae faintly lined below; coxal setae II slightly ahead of transverse line through setae III. Abdomen with tergites smooth or faintly microtuberculate, slighty lateral anterior furrows, giving way laterally to 2 or 3 sternites each; sternites microtuberculate; about 28 tergites; about 40-42 sternites. Lateral seta 15 μ long, on about sternite 9; first ventral 45 μ long, on about sternite 22; second ventral 9 μ long, on about sternite 30; third ventral 12 μ long, on about sternite 4 from rear; accessory seta present. Female genitalia 25 μ wide, 20 μ long, coverflap with 10-12 furrows, seta 25 μ long.

Male about 150-160 μ long, 50 μ wide, 40 μ thick.

Type locality: Winters, California (Wolfskill Ranch). **Collected**: May 3, 1943, by Dr. L. M. Smith and the writer. **Host**: *Amygdalus communis* L., almond. **Relation to host**: These are silver mites, inhabiting both leaf surfaces and green terminal growth. **Type slide**: so designated, with above data. **Paratype slides**: three in number as above. The peach silver mite, *Phyllocoptes cornutus*, has the apex of the shield lobe evenly acuminate in lateral view. The new species has this lobe indented above the spines in lateral view.

Acaphylla Keifer, new genus

Shield triangular, anterior lobe overhanging rostrum; dorsal tubercles set ahead of rear margin, the setae pointing up and forward. Rostrum small, projecting down. Coxae with seta I missing. Forelegs with all seta. Hindlegs with patellar seta missing. Featherclaws divided. Tergites smooth, of moderate width, forming a longitudinal mid-dorsal ridge; sternites microtuberculate. Abdominal setae as usual except no accessory seta. Female genital coverflap with longitudinal furrows.

Genotype: *Acaphylla steinwedeni*, n. sp.

This genus is a member of the *Epitrimeri*. It is most closely related to *Tegonotus* by the smooth tergites forming the longitudinal ridge. It is separated from that genus by the divided featherclaws and absence of both coxal seta I and hind patellar seta.

Acaphylla steinwedeni Keifer, new species

Plate 176

Female 175-190 μ long, 60 μ wide, 45-50 μ thick, orange color, spindleform, blunter anteriorly. Rostrum 30 μ long, apical seta 15 μ long. Shield 60 μ long, 60 μ wide, a central longitudinal elevation well outlined, the anterior lobe bilobed, overhanging rostrum; coarse tubercles laterally above coxae; dorsal tubercles 25 μ apart, set well ahead of rear margin; dorsal setae 4.5 μ long, directed cephalodorsad. Forelegs 40 μ long, tibia 9 μ long, tarsus 7 μ long, seta on inner side, claw 5 μ long, knobbed; featherclaw 3 rayed, bifurcate. Hindlegs 34 μ long, patellar seta absent, tibia 7 μ long, tarsus 7 μ long, claw 4.5 μ long. Coxae with seta I missing. Abdomen with moderately broad, smooth tergites, forming a central longitudinal ridge; sternites microtuberculate except near confluence with tergites; 30 tergites; about 60-65 sternites. Lateral seta about 12 μ long, on about sternite 5; first ventral 30 μ long, on about sternite 21; second ventral 23 μ long, on about sternite 38; third ventral 17 μ long, on about sternite 6 from rear; accessory seta absent. Female genitalia basally with fine tubercles and longitudinal scoring 24 μ wide, 20 μ long, coverflap with 6 to 8 longitudinal ridges; seta 9 μ long.

Male 140-160 μ long.

Type locality: Sacramento, California. **Collected**: April 6, 1943, by J. B. Steinweden and the writer. **Host**: *Camellia japonica* L. **Relation to host**: The mites are leaf vagrants. They occur principally on the underside. The amount of leaf browning they do has not been determined because they have so far only been found with *Calacarus adornatus* K. **Type slide**: with the above data, of specimens taken by J. B. Steinweden and the writer. **Paratype slides**: three of these bear the Sacramento data. Three additional slides are of specimens taken at Lodi, California, on the same date. I take pleasure in naming this for Mr. J. B. Steinweden of the State Department who found this mite at Lodi.

Specimens of this mite have also been seen from Southern California in 1942 and from Alabama camellia in 1941. Both *Acaphylla steinwedeni* and *Calacarus adornatus* overwinter on the leaves and show no deuterogyny as do members of the *Epitrimeri* on deciduous shrubs.

Cupacarus Keifer, new genus

Shield somewhat rounded anteriorly, the anterior lobe projecting abruptly over rostrum; dorsal tubercles set ahead of rear margin, the setae pointing centrad. Rostrum small, projecting down. All coxal and leg setae present. Featherclaw simple. Narrow tergites non-microtuberculate, forming a narrow longitudinal dorsal trough, flanked by subdorsal ridges; a broad supralateral trough and a lateral ridge; sternites microtuberculate. All abdominal setae present. Female genital coverflap with transverse furrows or lines.

Genotype: *Cupacarus cuprifestor*, new species.

This genus belongs to the *Epitrimeri* but is immediately distinguished by the narrow dorsal trough and moderately narrow tergites.

Cupacarus cuprifestor Keifer, new species

Plate 177

Female 160-180 μ long, 60 μ wide, 55 μ thick, spindleform, light brown. Rostrum 30 μ long, projecting down, antapical seta 8 μ long. Shield 46 μ long, 52 μ wide, the discal design faint, the anterior lobe indented in lateral view; dorsal tubercles 20 μ apart, ahead of rear margin; dorsal setae 10 μ long, projecting up and centrad. Forelegs 35 μ long, tibia 8.5 μ long, tarsus 8.5 μ long, claw 8.5 μ long, tapering, featherclaw 6 rayed. Hindlegs 33 μ long, tibia 7 μ long, tarsus 7 μ long, claw 8.5 μ long. Coxae with anterior pair separated. Abdomen with non-tuberculate tergites, microtuberculate sternites; 40-45 tergites; 70-80 sternites. Lateral seta 40 μ long, on about sternite 6; first ventral 45 μ long, on about sternite 23; second ventral 38 μ long, on

about sternite 48; third ventral 23 μ long, on about sternite 5 from rear; accessory seta present. Female genitalia 26 μ wide, 17 μ long, coverflap with some curved transverse lines; seta 20 μ long.

Male not studied.

Type locality: San Francisco, California. **Collected**: December 28, 1942, by the writer. **Host**: *Cupressus macrocarpa* Hartw., Monterey Cypress. **Relation to host**: The mites lurk in and around the crevices on the twig tips. **Type slide**: so designated, with the above data. **Paratype slides**: 8 in number, with the above data except 4 are dated May 23, 1943.

Anthocoptes punctidorsa Keifer, new species

Plate 178

Female about 150-180 μ long, 50-55 μ wide, 50-55 μ thick, light yellow, robust-spindleform. Rostrum 26 μ long, projecting down, apical seta short. Shield 35 μ long, 40 μ wide, design a network of ridges, anterior lobe short; dorsal tubercles 23 μ apart, large, on rear margin; dorsal setae 60 or more μ long, projecting up or backward. Forelegs 35 μ long, tibia 8 μ long, tarsus 8.5 μ long, claw 7.5 μ long, knobbed, featherclaw 2 rayed. Hindlegs 33 μ long, tibia 6 μ long, tarsus 8.5 μ long, claw 8.5 μ long. Coxae with setae II anterior to a transverse line through setae III. Abdomen with tergites beset with spiniferous microtubercles, the tubercles quite prominent dorsally; from 15-30 tergites; 48-50 sternites. Lateral seta 18 μ long, on about sternite 7; first ventral 62 μ long, on about sternite 18; second ventral 12 μ long, on about sternite 28; third ventral 32 μ long, on about sternite 4 from rear; accessory seta present. Female genitalia 21 μ wide, 13 μ long, coverflap with about 8 ridges, seta 17 μ long.

Male 120-150 μ long, 45 μ wide, 45 μ thick, about 13-15 tergites and about 40 sternites.

Type locality: Sacramento, California. **Collected**: June 7, 1943, by the writer. **Host**: *Ulmus pumila* Linn., Chinese elm. **Relation to host**: The mites are leaf vagrants, chiefly on the undersurface. **Type slide**: so designated, with the above data. **Paratype slides**: 3 in number. The figures indicate the usual type of both sexes, however, some females approach the male tergal structure.

Diptilomiopus calicoryli Keifer, new species

Plate 179

Female about 200 μ long, 65 μ wide, about 55 μ thick, light yellow, spindleform; in life covered by dense white flocculent wax. Rostrum 49 μ long, attenuate, projecting down. Shield 52 μ long, 52 μ wide, a faint pattern present; anterior lobe well over rostrum, indented apically; dorsal tubercles 34 μ apart, projecting, set ahead of rear margin; dorsal setae 26 μ long, projecting forward. Forelegs 50 μ long, femoral seta missing, tibia 16 μ long, tibial seta placed distally, tarsus 11 μ long, claw 8 μ long, somewhat curved, knobbed, featherclaw about 7 rayed. Hindlegs 47 μ long, tibia 14 μ long, tarsus 9 μ long, claw 9 μ long. Coxae with all setae present, microtuberculate; anterior coxae not quite touching, separated by a submental ridge. Abdomen with smooth tergites; a slight anterior subdorsal furrow on each side; sternites with fine microtubercles; 40-45 tergites; 100 or more sternites. Lateral seta 30 μ long, on about sternite 14; first ventral 55 μ long, on about sternite 44; second ventral 15 μ long, on about sternite 67; third ventral 34 μ long, on about sternite 9 from rear; accessory seta present but very minute. Female genitalia 29 μ wide, 17.5 μ long, coverflap smooth, with slight transverse basal microtubercular area; seta 10 μ long.

Male about 180 μ long, 55 μ wide, 50 μ thick; similar to female in general characters. Deutogyne unknown.

Type locality: Sacramento, California. **Collected**: July 29, 1943, by the writer. **Host**: *Corylus rostrata californica* A., California hazel (Park specimen). **Relation to host**: The mites are vagrants on the undersurface of the leaf. **Type slide**: so designated, with the above data. **Paratype slides**: four in number, as above. The structure of this mite suggests relationship to *Diptilomiopus sacramentae* K. on alder.

HOST LIST

CUPRESSACEAE

Cupressus macrocarpa Hartw., Monterey Cypress
Cupacarus cuprifestor n. sp., twig infestor

CORYLACEAE

Corylus rostrata californica A., California Hazel
Diptilomiopus calicoryli n. sp., leaf vagrant

ULMACEAE

Ulmus pumila Linn., Chinese Elm
Anthocoptes punctidorsa n. sp., leaf vagrant

ROSACEAE

Prunus communis Fritsch, Almond
Phyllocoptes paracornutus n. sp., silver mite

TERNSTROEMIACEAE

Camellia japonica Linn., Camellia
Acaphylla steinwedeni n. sp., rust mite

SAPINDACEAE

Litchi chinensis Sonn., Litchi nut
Eriophyes litchii n. sp., red leaf erineum

ARALIACEAE

Hedera helix Linn., English Ivy
Phytoptus hedericola n. sp., bud infestor

OLEACEAE

Ligustrum ovalifolium Hassk., Privet
Eriophyes lingustri n. sp., bud infestor

COMPOSITAE

Ambrosia psilostachya DC., Western Ragweed
Eriophyes boycei n. sp., leaf bead galls
Phyllocoptes ambrosiae n. sp., leaf vagrant

DESIGNATIONS ON PLATES

AP1—Internal female genitalia
D—Dorsal view of mite
DA—Dorsal view of anterior section
ED1—Dorsal skin in lateral view
ES—Detail of side skin
F—Featherclaw
GF1—Female genitalia and coxae from below
L—Left legs
S—Side view of mite
SA—Side view of anterior part of mite

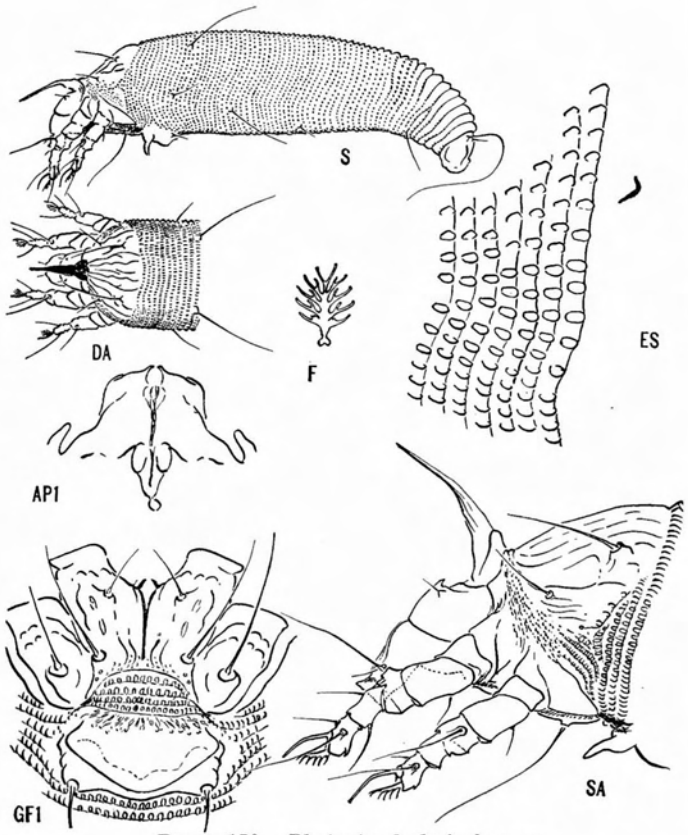

PLATE 170. *Phytoptus hedericola* n. sp.

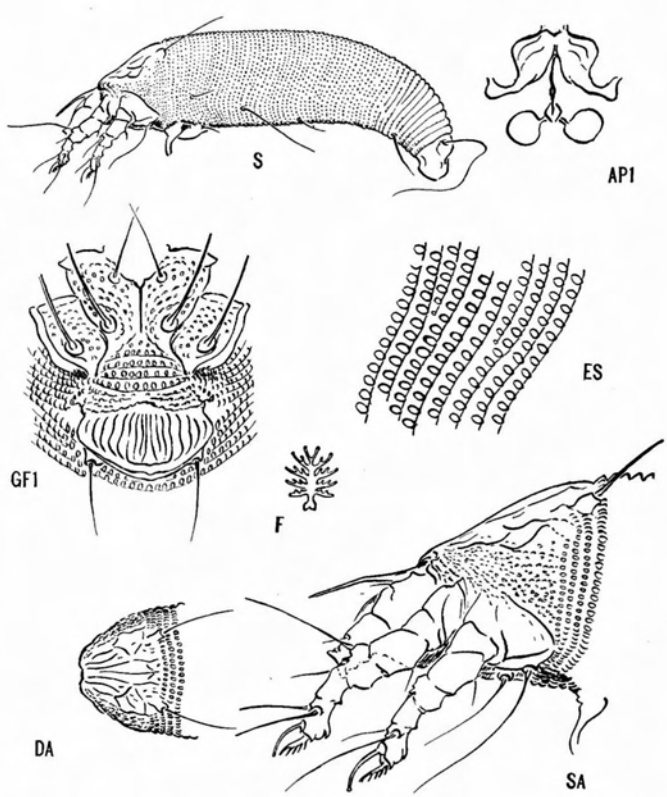

PLATE 171. *Eriophyes litchii* n. sp.

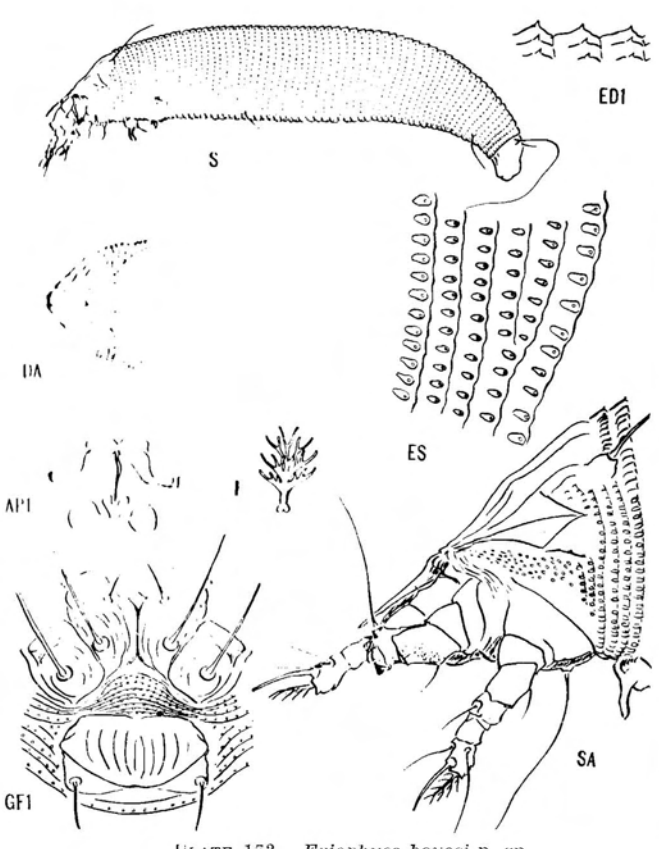

PLATE 172. *Eriophyes boycei* n. sp.

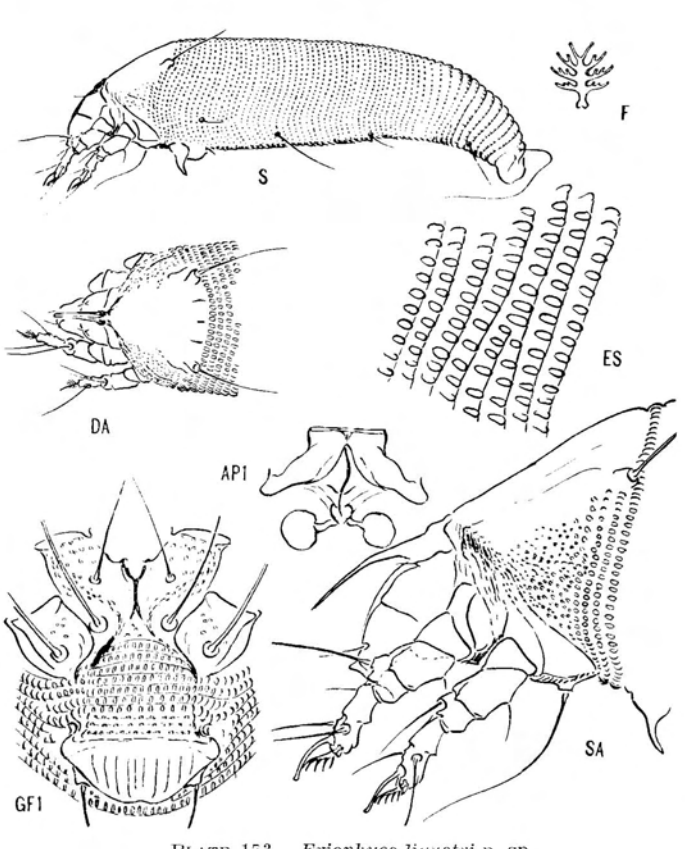

PLATE 173. *Eriophyes ligustri* n. sp.

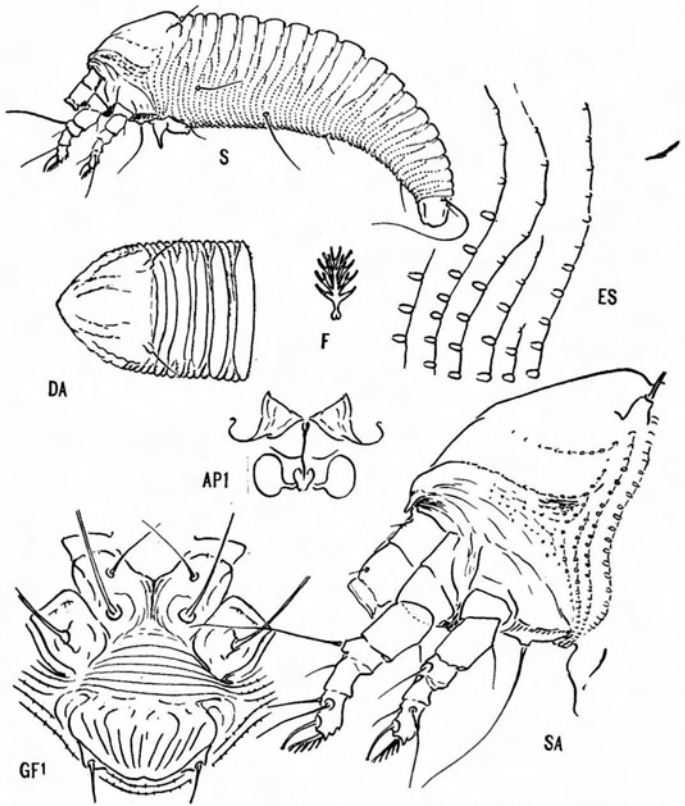

PLATE 174. *Phyllocoptes ambrosiae* n. sp.

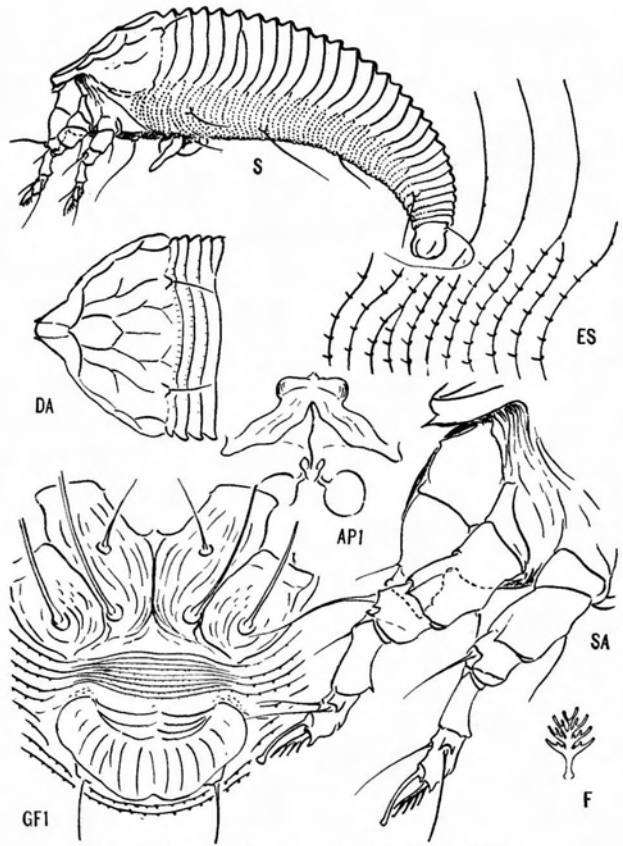

PLATE 175. *Phyllocoptes paracornutus* n. sp.

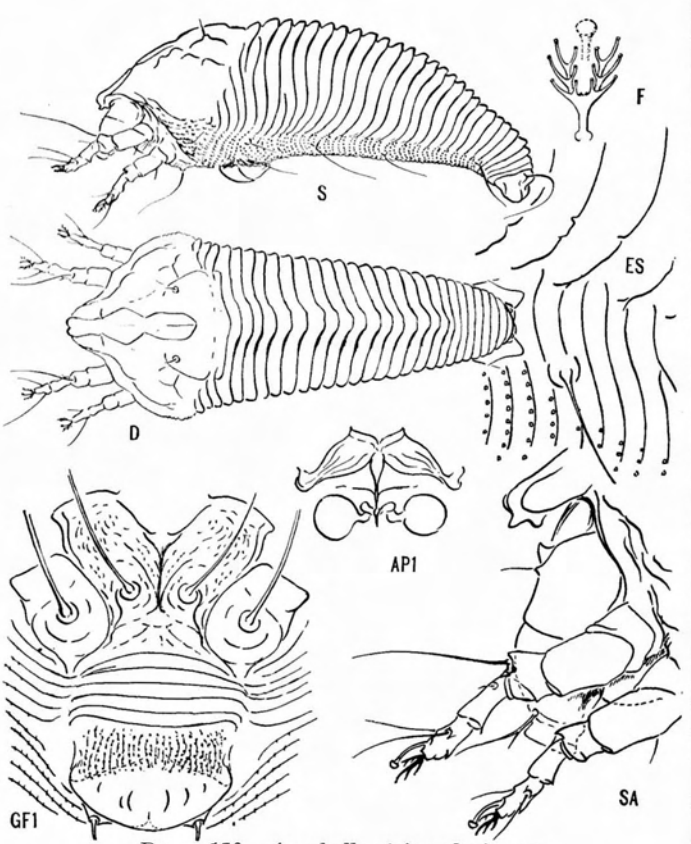

PLATE 176. *Acaphylla steinwedeni* n. sp.

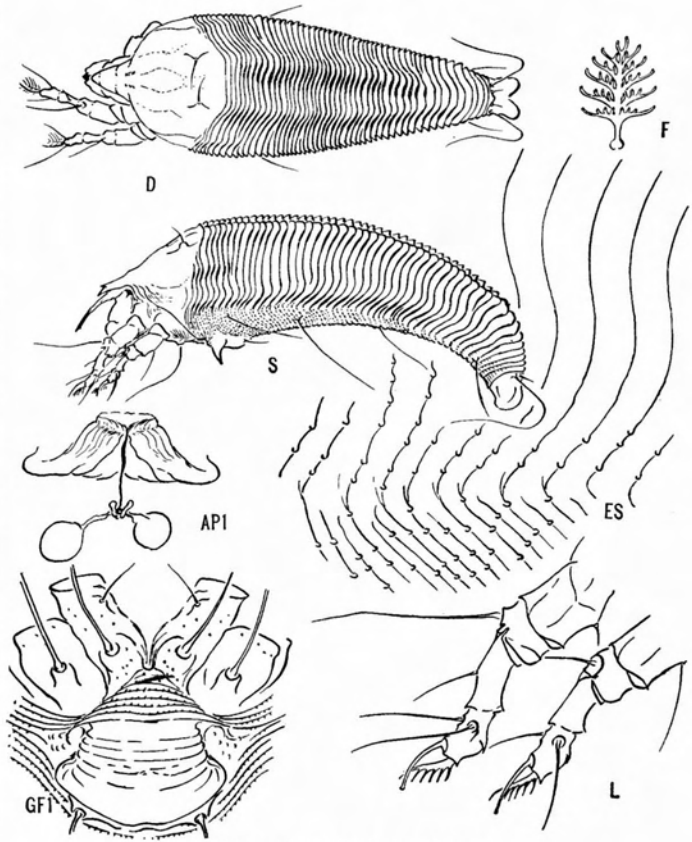

PLATE 177. *Cupacarus cuprifestor* n. sp.

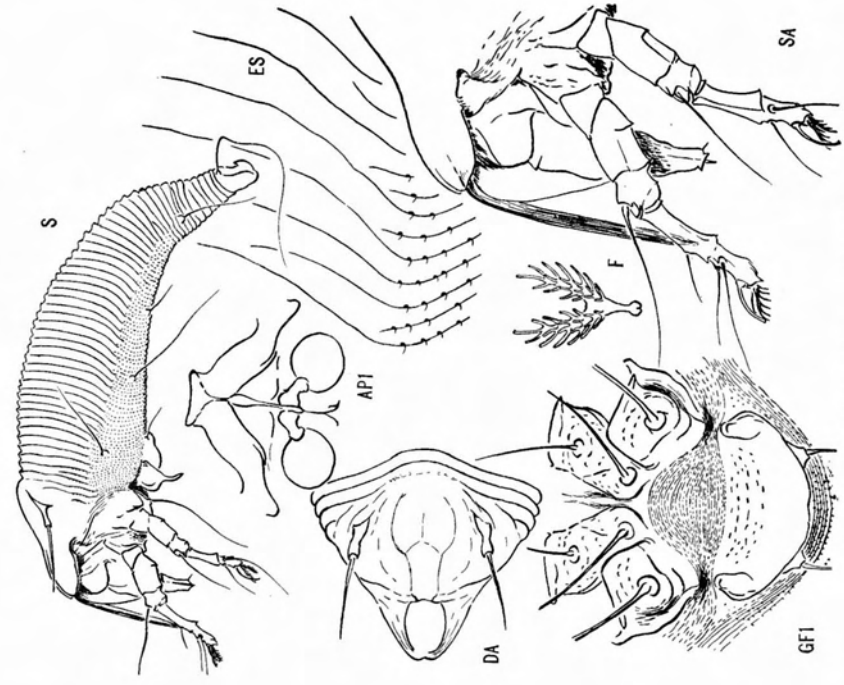

PLATE 179. *Diptilomiopus calicoryli* n. sp.

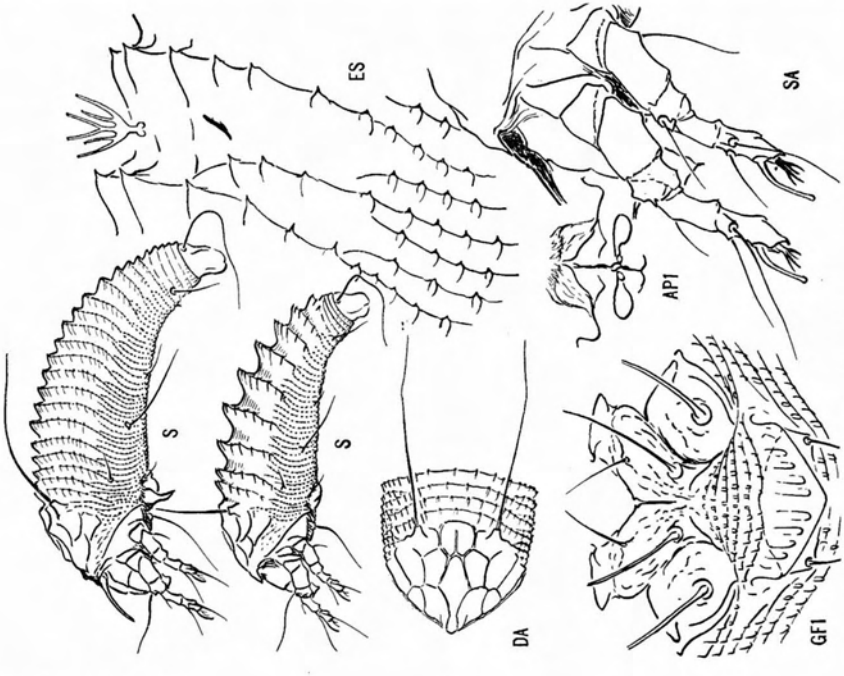

PLATE 178. *Anthocoptes punctidorsa* n. sp.

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